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G03C G03D

(54) Infrared treatment of processed lithographic plates

(57) Heating of processed lithographic printing plates with infra-red radiation increases their resistance to solvent. The method allows for the heating to be combined with development in a single automatic processing machine so that a separate baking machine is unnecessary. The exposed plate is developed in bath 12, sprayed by nozzle 16, gummed in bath 14 and passed under infra-red tubes 26.

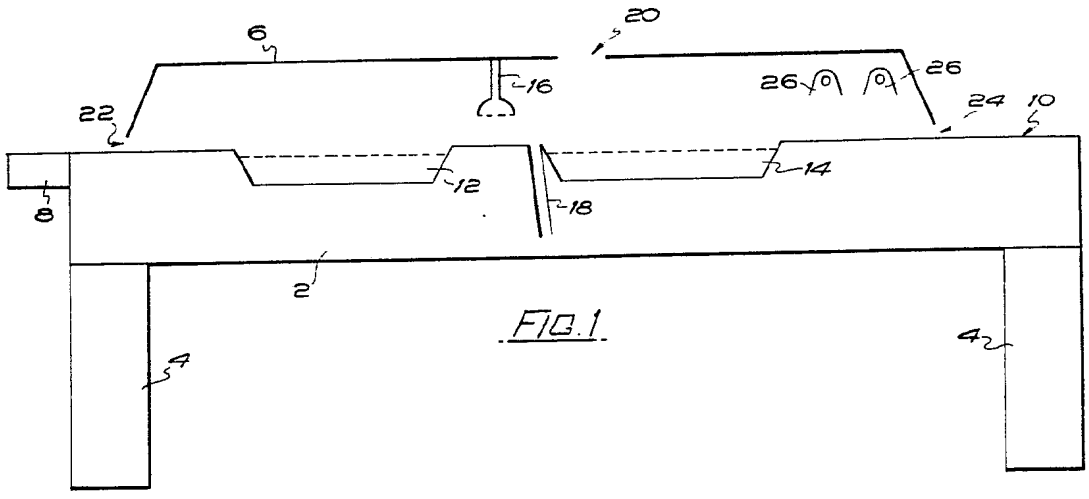

FIG.1

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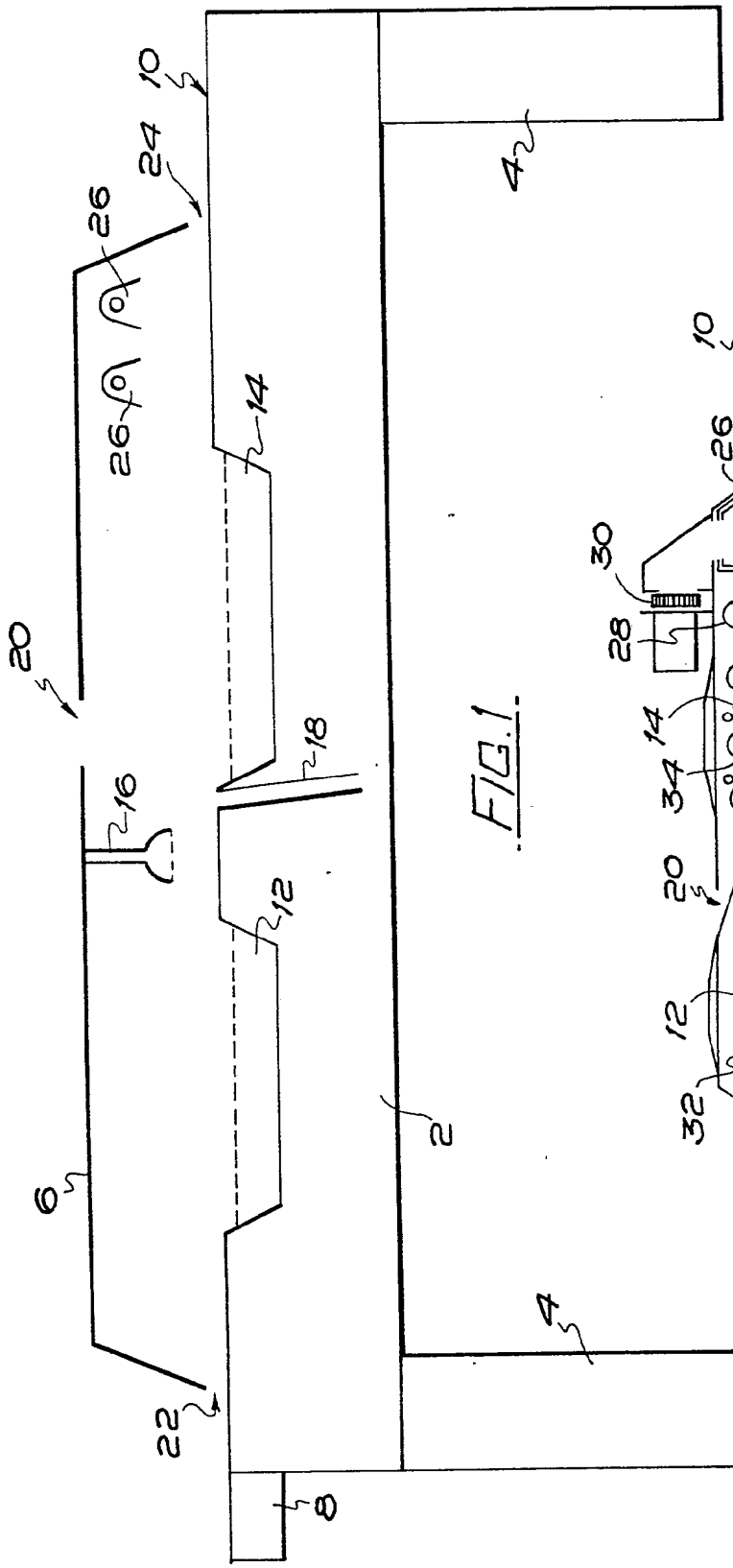

FIG.1.

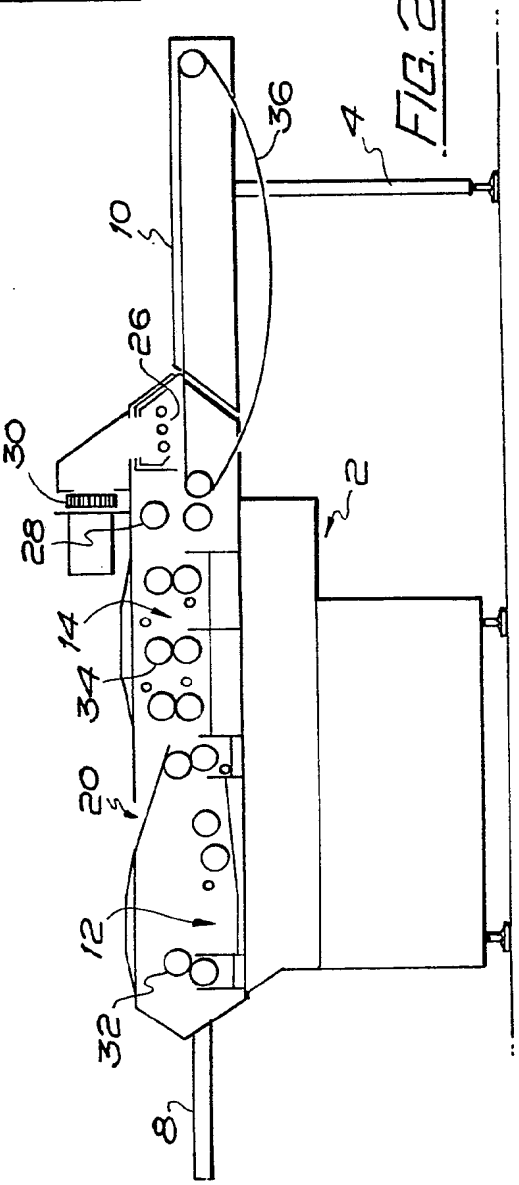

FIG.2.

Heat treatment of lithographic printing plates

The invention relates to the processing of lithographic printing plates and particularly, but not necessarily, in conjunction with developing and gumming.

It is common practice, after developing exposed lithographic printing plates in an aqueous solution, to dry the plates, and automatic developing machines are known in which plates, having been passed through a developer solution, are subjected to a hot-air drying process.

Another hot-air process is known, commonly refered to as baking, in which exposed and developed plates are subjected to high temperatures in an oven in order to increase the abrasion resistance of the image areas of the plates so that during printing the plates can be used to produce a larger number of copies, without deterioration, that would be the case without the baking treatment.

Unexpected benefits, however, have been found to result from a thermal process distinguishable from the above treatments.

According to one aspect of the invention there is provided a method of treating exposed and developed lithographic printing plates comprising subjecting the plates to infra-red radiation.

According to a further aspect of the invention there is provided a method of treating exposed and developed lithographic printing plates comprising subjecting the plates to thermal treatment so as to increase the subsequent solvent resistance of the plates without markedly improving the abrasion resistance thereof.

Preferably the treatment by infra-red radiation is effected immediately after development or immediately after gumming which has immediately followed development.

According to yet another aspect of the invention there is provided apparatus for treating exposed and developed lithographic printing plates comprising means for subjecting the plates to infra-red radiation.

The apparatus may conprise conveyor means for passing the plates continuously and successively through development and heat-treatment zones.

The radiation supplying means may comprise at least one infra-red tube arranged transversely of the direction of movement of, and above, the conveyor means.

The radiation supplying means may comprise a plurality of transverse infra-red tubes spaced apart in the direction of movement of the conveyor means. The spacing may be varied, and the height of the or each tube above the plates may also be varied.

A specific embodiment of the invention will now be described by way of non-limiting example and with reference to the accompanying drawings of which:-

Fig. 1 shows in schematic side elevation an automatic plate processing machine.

Fig. 2 shows in schematic side elevation an automatic plate processing machine in an alternative embodiment.

As shown in Figure 1, the plate processing machine comprises a cabinet 2 supported on legs 4 and substantially covered by a cover 6. To the left of the cover as shown in the drawing the cabinet has an outward extension 8 which provides an entry station for plates, whilst to the right of the cover as shown, the cabinet presents a removal station 10.

Between the entry and removal stations and beneath the cover 6 the cabinet comprises shallow tanks 12 and 14 respectively for containing developing solution and gumming preparations. A spray nozzle 16 depends from the cover 6 between the tanks, whilst a drain pipe 18 is arranged under the nozzle.

The cover has an opening 20 between the nozzle 16 and the gumming tank 14 for the entry of plates which require re-gumming, whilst gaps 22, 24 are provided between the cover and the cabinet for the passage therethrough of plates. Rollers, not shown, are provided for transporting the plates from the entry station to the removal station.

As described above, the machine is at least substantially conventional.

Infra-red heating tubes 26 are supported beneath the cover 6 between the gumming tank 14 and the exit gap 24 in order to irradiate plates passing between the tank and the gap. Control means not shown are provided to control the infra-red energy imparted to the plates as required.

In use of the apparatus, plates which have been image-wise exposed are passed in conventional manner, by means not shown either through gap 22 and tank 12 and then passing under spray 16 and through tank 14 or, alternatively, for re-gumming, through opening 20 and tank 14. After removal from the tank 14 the plates pass under the infra-red tubes 26 by means of which they are dried.

In addition to drying, however, it has been found that the infra-red treatment also imparts a property to the plates which is not provided by conventional hot-air drying or baking. Whilst the treatment does not necessarily increase the abrasion resistance of the plates, it is found that it does increase the resistance to subsequent treatment with solvents, such as white spirits. This improcement had further advantages in that in order to increase solvent-resistance after development, it has hitherto been the practice to modify the light-sensitive coating of the plates, but this in turn tends to increase the expose and development time required. With the improvement in solvent-resistance provided in processing by virtue of the thermal treatment here described, the light-sensitive coating may not need the modification, and shorter exposure and development times can be expected.

In the embodiment shown in Figure 2 the same reference numbers have been used for similar features, but it will be senn to have additional features, including a hot-air drying station 28 and an extraction fan 30 between the gumming unit and the infra-red lamps. The plates are passed through the machine by means of roller pairs such as 32, and 34, whilst they are

passed under the three infra-red tubes 26 on the upper reach of a conveyor belt 36.The belt may move at a surface speed equal to or slightly in excess of the surface speed of the rollers.

The apparatus of the invention is only slightly longer that a conventional automatic developing machine, and yet it has been found that the irradiation from the infra-red heaters is sufficient significantly to increase the solvent-resistance of the plates, if not also to increase the frictional resistence. This is true even whilst the plates are being passed at a rate in the region of 1 m/min. or less, which gives them a much shorter processing time than in a conventional baking oven. By a suitable adjustment of the height of the tubes 26 in the range 10 to 30 mm above the plates, and the spacing of the tubes where there are more than one, depending on the plate thickness, any tendency on the part of the plates to buckle can be minimised. Useful results can be obtained with plate temperatures of less than 200^{o}C and even down to 171^{o}C.

CLAIMS

1. A method of treating exposed and developed lithographic printing plates comprising subjecting the plates to infra-red radiation.

2. A method of treating exposed and developed lithographic printing plates comprising subjecting the plates to thermal treatment so as to increase the subsequent solvent resistance of the plates without markedly improving the abrasion resistance thereof.

3. A method according to Claim 1 or Claim 2 wherein the treatment by infra-red radiation is effected immediately after development or immediately after gumming which has immediately followed development.

4. A method according to any preceding Claim wherein the plates are passed continuously and successively through development and heat-treatment zones.

5. A method according to any preceding Claim wherein the rate of passage through the heat-treatment zone is equal or less than the rate of passage through the development zone.

6 Apparatus for treating exposed and developed lithographic printing plates comprising means for passing the plates continuously and successively through development and infra-red heat-treatment zones.

7. Apparatus according to Claim 6 wherein the heat-treatment zone includes at least one infra-red tube arranged transversely of the direction of movement of the plates

8. Apparatus according to Claim 6 or Claim 7 further comprising conveyor means for carrying the plates through the heat-treatment zone.

9. Apparatus according to Claim 7 or 8 comprising a plurality of transverse infra-red tubes spaced apart in the direction of movement of the plates

10. A method of treating exposed and developed lithographic printing plates substantially as described.

11. Apparatus for treating exposed and developed lithographic printing plates substantially as described with reference to the drawings.

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